PB89-162119

Pesticide Fact Sheet Number 194: Difenzoquat

(U.S.) Environmental Protection Agency
Washington, DC

Dec 88

U.S. Department of Commerce
National Technical Information Service
NTIS

PB89-162119

United States
Environmental Protection
Agency

Office of Pesticides and Toxic Substances
Office of Pesticide Programs (TS-788C)
Washington, DC 20460

540/FS-89-035

EPA

Pesticide Fact Sheet

Name of Chemical: DIFENZOQUAT
Reason for Issuance: REGISTRATION STANDARD
Date Issued: December 1988
Fact Sheet Number: 194

1. DESCRIPTION OF CHEMICAL

Generic Name: 1,2-dimethyl-3,5-diphenyl-1H-pyrazolium

Common Name: Difenzoquat

Trade and Other Names: AVENGE

EPA Shaughnessy Codes: 106401 (Salt)

Chemical Abstracts Service (CAS) Number: 43222-48-6 (Salt)

Year of Initial Registration: 1974

Pesticide Type: Herbicide

Chemical Family: Pyrazolium

U.S. and Foreign Producers: American Cyanamid Company

REPRODUCED BY
U.S. DEPARTMENT OF COMMERCE
NATIONAL TECHNICAL INFORMATION SERVICE
SPRINGFIELD, VA. 22161

50272-101

REPORT DOCUMENTATION PAGE	1. REPORT NO.	2.	3. Recipient's Accession No. PB89 162119/AS
4. Title and Subtitle: EPA Pesticide Fact Sheets - DIFENZOQUAT No. 194			5. Report Date: December 1988
7. Author(s): EPA, Office of Pesticide Programs, Registration Division			8. Performing Organization Rept. No.: 540/FS-89-035
9. Performing Organization Name and Address: U.S. Environmental Protection Agency, Office of Pesticide Programs, Registration Division (TS-767C), 401 M Street, SW, Washington, D.C. 20460			10. Project/Task/Work Unit No. 11. Contract(C) or Grant(G) No. (C) (G)
12. Sponsoring Organization Name and Address: Same as #9			13. Type of Report & Period Covered 14.

15. Supplementary Notes

16. Abstract (Limit: 200 words)

This document contains up-to-date chemical information, including a summary of the Agency's regulatory position and rationale, on a specific pesticide or group of pesticides. A Fact Sheet is issued after one of the the following actions has occurred.

1. Issuance or reissuance of a registration standard,
2. Issuance of each special review document,
3. Registration of a significantly changed use pattern,
4. Registration of a new chemical, or
5. An immediate need for information to resolve controversial issues relating to a specific chemical or use pattern.

17. Document Analysis a. Descriptors

Pesticides, regulations, Chemical Information Fact Sheet, Use Patterns, science findings.

b. Identifiers/Open-Ended Terms

c. COSATI Field/Group

18. Availability Statement: Publicly Available	19. Security Class (This Report): Unclassified	21. No. of Pages: 3
	20. Security Class (This Page): Unclassified	22. Price: PC A10/MF A01 $6.95

(See ANSI-Z39.18) See Instructions on Reverse OPTIONAL FORM 272 (4-77)

2. USE PATTERNS AND FORMULATIONS

Application: A postemergence herbicide to control wild oats in alfalfa (seed crop in CA only), wheat and barley.

Types and Methods of Application: Applied as a postemergence broadcast treatment by aerial and ground equipment.

Application Rates: 0.6 - 1.0 lb cation/A

Types of Formulations:

Single active ingredient formulations:

31.2% SC/L, 31.8% SC/L, and 62.5% SC/S

Difenzoquat can be tank mixed with bromoxymil, metsulfuron methyl, chlorsulfuron, 2,4-D (2,4-dichlorophenoxyacetic acid) and MCPA (2-methyl-4-chlorophenoxyacetic acid).

3. SCIENCE FINDINGS

Summary Science Statement

Chemical Characteristics of the Technical Material

Physical State: Solid

Color: White to off-white

Odor: Odorless

Molecular Weight and Formula: 360.4 - $C_{18}H_{20}N_2O_4S$ (Salt)

Melting Point: 155 - 157°C Difenzoquat decomposes above 160°C.

Vapor Pressure: negligible

Density: 41 lb/cu ft

Solubility in various solvents: 76.5% in water at 23°C. Poorly soluble in most organic solvents.

Toxicology Characteristics

Difenzoquat is moderately toxic by the oral route (LD_{50} for male rats - 270 mg/kg) and slightly toxic via the dermal route of exposure (LD_{50} for male rabbits - 3540 mg/kg). Difenzoquat was found to be slightly irritating to the eyes and moderately irritating to abraded skin and non-irritating to intact skin. The inhalation route of exposure does not indicate any toxicity problems [LC_{50} for male rats is greater than 298.2 mg/l (1 hr. exposure)].

Major routes of exposure: Dermal and inhalation.

Subchronic toxicity: No compound related effects were observed in 90-Day Feeding Study. Systemic NOEL was 2500 ppm (62.5 mg/kg:HDT). (HDT = Highest Dose Tested).

Oncogenicity: Difenzoquat was negative for oncogenicity at the 5000 ppm (250 mg/kg:HDT) level in rats.

Teratogenicity: Difenzoquat was negative for teratogenicity, fetotoxicity and maternal toxicity in rats at the 2500 ppm (125 mg/kg:HDT) level.

Reproduction: A 3-generation rat reproduction study found the parental NOEL was equal to or greater than 2500 ppm (125 mg/kg:HDT) and reproductive/developmental NOEL was 500 ppm (25 mg/kg). The only maternal effect observed in all three generations was a decreased body weight gain in the high dose group during the premating period.

Mutagenicity: Insufficient data available to evaluate the mutagenicity potential.

Environmental Characteristics

Difenzoquat is tightly bound to soil particles and does not readily leach.

Ecological Characteristics

Avian acute toxicity: Difenzoquat is slightly toxic to birds. Mallard ducks (LC_{50} - 10,388 ppm) and bobwhite quail (LC_{50} - 4640 ppm).

Freshwater fish acute toxicity: Difenzoquat is slightly toxic to fish: Bluegill (LC_{50} - 90.4 ppm) and Rainbow Trout (LC_{50} - 76-99 ppm).

Freshwater invertebrate toxicity: Difenzoquat is moderately toxic to freshwater invertebrates. Daphnia (LC_{50} - 2.6 ppm).

TOLERANCE ASSESSMENT

Tolerances have been established for residues of difenzoquat in a variety of raw agricultural commodities (40 CFR 180.369).

The current U.S. tolerances for difenzoquat range from 0.05 ppm in fat, meat, meat byproducts and wheat grain, 0.2 ppm for barley grain, and 20 ppm for wheat and barley straw. A Canadian maximum residue level of 0.1 ppm (negligible residue) has been established for wheat and barley grain. There are no Mexican Tolerances or CODEX MRLs for difenzoquat.

4. Summary of Regulatory Positions

Based on available information, the Agency has made the following determinations:

- Difenzoquat does not exceed any risk criteria for Special Review.
- Difenzoquat does not meet the criteria for restricted use.
- The Agency is not imposing any special labeling for endangered or threatened species because of its use patterns of single application postemergence to wheat and barley, and because of low toxicity to fish and birds.
- Based on available toxicology data the Agency has no concerns with human exposure which would require special protective clothing.
- No groundwater advisory labeling is required because difenzoquat does not readily leach.
- No tolerances for feed items treated with difenzoquat will be issued until data gaps for animal metabolism and magnitude of residue have been fulfilled.

5. Summary of Major Data Gaps	Timeframe for Submission[1/]
Toxicology	
Acute Oral Toxicity in one sex (females)	9 months
Acute Dermal Toxicity in one sex (females)	9 months
Acute Inhalation Toxicity in one sex (females)	9 months
Dermal Sensitization	9 months
Subchronic Dermal (21-day)	9 months
Chronic Toxicity in one species (nonrodent)	50 months
Teratogenicity in one species (rat)	15 months
Oncogenicity in one species (mouse)	50 months
Mutagenicity (Gene mutation, chromosomal aberration, and direct DNA damage studies).	12 months
Metabolism	24 months
Environmental Fate	
Hydrolysis	9 months
Photodegradation in water and on soil	9 months
Aerobic and anaerobic soil metabolism	27 months
Leaching and Adsorption/Desorption	12 months
Volatility (Lab)	12 months
Terrestrial field dissipation (soil)	27 months
Accumulation rotational crops (confined)	39 months
Fish accumulation	12 months
Product Chemistry	
Product Identity and Disclosure of Ingredients	9 months
Description of Manufacturing Process	9 months
Discussion of Formulation and Impurities	9 months
Preliminary Analysis of Product Samples	12 months
Certification of Ingredient Limits	12 months
Analytical Methods to Verify Certified Limits	12 months
Physical and Chemical Characteristics	9 months
Residue Chemistry: Tolerance Reassessment	
Nature of the Residue (Metabolism) in Livestock	18 months
Residue Analytical Methods	15 months
Storage Stability Data	18 months
Magnitude of Residue in Plants, and Fat/Meat/Meat of Animal Byproducts	18 months

1. Timeframe for submission is number of months from date of issuance of the registration standard, December 23, 1988.

6. CONTACT PERSON AT EPA

Richard F. Mountfort
Product Manager 23
Fungicide/Herbicide Branch
Registration Division (TS-767C)
Office of Pesticide Programs
Environmental Protection Agency
401 M Street, S. W.
Washington, D. C. 20460

Office location and telephone number:

Room 237, Crystal Mall #2
1921 Jefferson Davis Highway
Arlington, VA 22202
(703) 557-1830

DISCLAIMER: The information in this Pesticide Fact Sheet is a summary only and is not to be used to satisfy data requirements for pesticide registration and reregistration. The complete Registration Standard for the pesticide may be obtained from the National Technical Information Service. Contact the Product Manager listed above for further information.